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Trends and projections of climate change over the basin of Lake Guiers, Senegal

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Lake Guiers is an important water resource for the northern part of Senegal especially for agriculture and water supply. In this study, climate change over the basin of Lake Guiers as computed by Regional Climate Models (RCM) in the framework of Coordinated Regional Climate Downscaling Experiment (CORDEX) has been examined. Observed rainfall, temperature and evapotranspiration data from 1988-2012 in the basin were assessed, as well as derived indices of climate extremes to bridge the gap between regional climate change and local impacts. Results show that the basin of Lake Guiers experiences an increase of temperature of about 1.2°C and 3.1°C and an elevated warning, leading to significant increase of atmospheric water demand is projected. In addition an increasing trend in precipitation (+6.1mm/year) has been observed from 1988-2011 and precipitation projections reveal in the near-future changes an increase trend ranging between 5 and 48 % in Lake Guiers watershed. The end of the century in turn experiences precipitation decrease ranging between 10 and 25 % for respectively Representatives Concentrations Pathways (RCPs) 4.5 and 8.5 scenarios. The changes in evapotranspiration essentially follow those from the mean precipitation and temperature with more evapotranspiration during the near future and generalized decrease in the late century. In general, the future climate of the basin of Lake Guiers seems to be exposed to more severe conditions and water availability will be under much greater stress.